

Thermosolvatochromic Kamlet-Taft Parameters of Fluorinated Ethers *

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Perhaps the most well known set of solvent and solute descriptors are the Kamlet-Taft parameters. These parameters provide numerical values for three important solvent and solute interactions; dipolarity-polarizability, hydrogen-bond donor ability, and hydrogen-bond acceptor ability. Historically, scales of these parameters have been established to allow for qualitative intercomparison of solvent and solute properties. These parameters can also be used quantitatively in modeling solution equilibrium in the form of a linear solvation energy relationship (LSER). The frequency maxima of three solvatochromic probes were measured at temperatures spanning -10 to 70°C for liquid fluorinated ether based solvents. Pure solvents studied include methoxy-nonafluorobutane, ethoxy-nonafluorobutane and azeotropic solvent systems include methoxy-nonafluorobutane/ isopropanol, methoxy-nonafluorobutane/trans-1,2 dichloroethylene. The frequency maxima were used to calculate the thermosolvatochromic interaction parameters. Additionally, a comparison of the Kamlet-Taft parameters of the fluorinated ethers and the fluorinated hydrocarbon solvents will be presented.